PACKAGING

THE CAHNERS MAGAZINE FOR DECISION-MAKERS/FEBRUARY 1989

MEDICAL DEVICES TEST PACKAGING'S IMAGINATION

Special Report: What Was New At Pack Expo

Shelf-Presence Drives Blow-Molding Advances

Aerosol Line Handles Variety With Ease

New Developments On View At Britain's Pakex

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A CAHNERS PUBLICATION VOLUME 34 NUMBER 2

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Bottled Water Rides New Packaging Wave

Transparent resins, new sizes and shapes gain market share as this $2-billion industry begins using packaging to its best advantage

By Mark Spaulding Associate Editor

It covers 70 percent of the Earth's surface. Billions of gallons of it lie underground in aquifers or bubble up as springs, just for the taking. It's water . . . the ultimate commodity.

How does an industry sell something so ubiquitous? Something given away free in restaurants without asking? A product priced at least 1,000 times more than tap water? There's only one way . . . through packaging.

"Packaging is why someone will pay for water in the first place," says David M. Handler, marketing program specialist for General Electric Plastics. "And, superior packaging is why someone will pay more for it."

Consumers buy and drink bottled water for a myriad of reasons. It's a refreshing thirst-quencher. Its taste can be far superior to that from private wells and municipal sources. Safety concerns over local pollution and groundwater contamination lead many to their supermarket's bottled-water section. And, of course, status-seeking and the need to be fashionable also play a role in driving up bottled-water sales.

For decades, most bottled water was packaged in 5-gallon glass containers for the commercial cooler and home-delivery markets. Packaging was dictated to the industry. But now, with 1988 sales expected to top $2 billion, the situation is fast becoming reversed. Today, bottled water is packaged in a wide spectrum of container sizes—from 6 ounces to 6 gallons—and materials—polycarbonate, polyethylene, PET, PVC, glass and even metal cans.

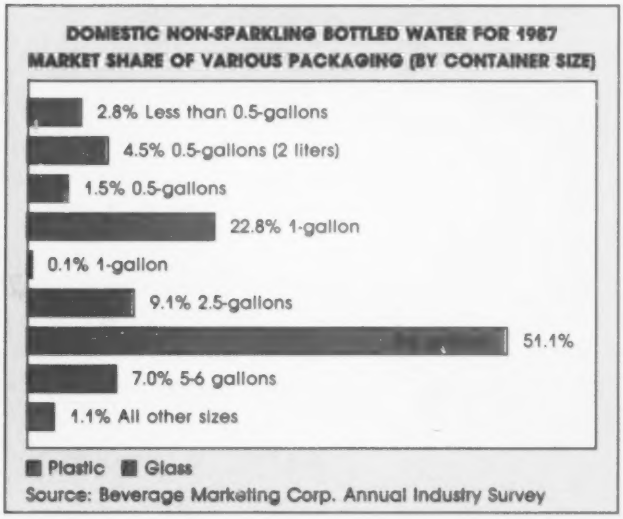
"The bottled water industry is still a few years away from using packaging to its best advantage," Handler says. "But there will definitely be more product differentiation in the future."

Clear containers, made from transparent resins such as polycarbonate and PVC, have gained an important toe-hold for premium-priced bottled water.

Consolidation and competition

Fueling the rapid growth of packaging choices for bottled water are two other important factors: foreign competition and industry consolidation. The tremendous marketing programs brought on by competition from foreign mineral-water companies in the late 1970s helped boost sales 300 percent between 1975 and 1985. Annual growth rates of 10 percent or more are expected to continue through 1992. The current wave of mergers and acquisitions—led by foreign giants such as Suntory, Perrier and Anjou International—has consoli-

Fastest growing bottled-water sizes? Small single-servings; 2.5 gallons



dated marketing resources aimed at increasing the retail sales of bottled water. Five companies dominate the industry, taking 40 percent of the business.

Still, some 450 bottling plants nationwide produce more than 600 different brands of bottled water, each of which must compete effectively for the consumer's favor. Bottled-water packagers are realizing that through a wider range of choices projecting quality, convenience and esthetics, they can command a premium from the consumer.

Clear, plastic containers made from transparent resins such as polycarbonate and polyvinyl chloride (PVC) are the strongest packaging wave to hit bottled water. Polycarbonate dominates the 5- to 6-gallon market for commercial and home delivery. It is currently used in almost 88 percent of these containers, according to a report from Beverage Marketing Corp., a New York-based research firm.

Now, clear plastic is being seen as an important product-positioning tool for retail packaging as well. "There is a great potential for clear containers despite the higher cost," says William Deal, president of the International Bottled Water Association. A 1-gallon bottle in PVC typically runs 20 to 30 cents each vs. six to eight cents each for polyethylene.

Clarity sells

"Water bottlers have learned that the customer prefers to see what he is buying," says Richard LaRue, market development manager for Occidental Chemical Corp., a PVC resin supplier. "And sales often increase when the product is in a clear package." He foresees clear plastic containers taking more than 80 percent of the retail bottled-water market in the next five years. LaRue cites PVC's clarity as the single most important factor in the change, as well as its barrier properties against the tastes and odors bottled water can pick up during distribution.

Handler offers a more conservative estimate. He sees clear plastic containers controlling 30 to 40 percent of retail bottled-water packaging. All else being equal, though, image does sell. "A mid-priced product with a crystal-clear bottle has the potential to surpass the low-end product in profitability and the high-end product in volume," says Handler.

"Store brands in clear PVC outsell translucent, even at a higher price," LaRue says. "Yet the basic label is exactly the same and says nothing about the quality of the product."

Does clarity really sell? Just ask Don McKay, president of Indian Springs Water Development Corp., in Dallas. The company's internationally distributed spring water sells twice the volume in 1-gallon polycarbonate containers vs. polyethylene. And he is planning to introduce a 2.5-gallon clear container in April. Indian Springs, which also sells six-packs of 10-ounce PVC bottles, will still rely on polyethylene for its distilled products, where taste isn't as important a selling factor, McKay says.

Despite the obvious clarity of glass, Indian Springs does not package any of its products in it because "of the obvious reasons: breakability, weight and insurance costs," says McKay. In fact, industry-wide, glass containers accounted for only 18.4 percent of all bottled-water gallonage in 1987, according to Beverage Marketing's report.

New sizes, shapes offer convenience

A second wave of new sizes, potential new shapes and other convenience features are beginning to make their mark on bottled-water packaging. Two-and-a-half-gallon bottles are now probably the fastest growing size of smaller packages, according to Dean Hebb, Liqui-Box Corp. national sales manager. The market share for 2.5 gallons is growing at an 8.3-percent annual rate. These containers are usually blow-molded with integral handles and have taps for easier dispensing. The 2.5-gallon is now made only in polyethylene, but Liqui-Box introduced a demonstration size recently in a clear resin.

Plastic bottled-water containers less than 2 liters in size are also experiencing significant growth. Once the sole domain of glass, PVC and PET are now making important inroads for domestic and foreign bottled waters in single-serving sizes. This size in plastic has come from virtually zero in 1985 to capture 2.8 percent of the market, Beverage Marketing says.

Typical single-serving bottles contain anywhere from 6.5 to 12 ounces, and packagers of bottled water are discovering advantages soft-drink bottlers have known for years. Sold in a handy size of four- or six-packs, bottled water packaged this way can justify a price premium for the convenience.

Although the plastic "milk-bottle shape" still dominates the retail market as packagers rush to meet skyrocketing consumer demand, the future is bright for innovative new designs. Some possibilities include three-dimensional embossing of logos or even ice-cube patterns molded into clear containers. "Grocery displays can be improved," says Handler. "Built-in designs to create new stacking systems may limit the need for some secondary packaging." Handler also noted the premium-price potential of a polycarbonate pitcher of bottled water using a textured, cut-glass effect.

Another example is Indian Springs, which will soon introduce a PVC carafe in 1- and 1.5-liter sizes. The new packaging will appeal not only to the company's European customers but is one more way the bottled-water industry is using packaging to differentiate its products in a tough, competitive, domestic market. ■

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Outstanding	435
Above Average	436
Average	437
Below Average	438

MARK SPAULDING
Associate Editor
"The rapid growth of the bottled-water industry and its corresponding need for high-image packaging is reflected in the supermarket aisle, where a typical bottled-water display takes up as much as 16 feet of shelf facing."

RECYCLING NEWS

Soft-Drink Group Publishes Guidebook

Pamphlets cover each container material

The National Soft Drink Association has published a state-by-state guide to recycling and litter-reduction operations. The book, titled *Promoting Recycling to the Public*, also offers techniques for stimulating increased consumer interest in recycling of soft-drink containers.

In addition to the 104-page book, the NSDA has published separate pamphlets, each of which discusses the recycling of a specific container material. Together these publications provide a comprehensive overview of current recycling programs and useful strategies.

Much of the NSDA book is devoted to a detailed description of each state's anti-litter and/or recycling programs. Included in each description is the name of the program, its chief contact person and its public-information activities. Also included are the number of recycling centers participating in each state program, the tonnage of waste collected, membership dues and annual promotion budget.

New book and pamphlets published by the National Soft Drink Association provide a wealth of information on recycling efforts state-by-state.

In an introduction to the book, the NSDA editors say, "The most successful state programs seem to be those that are doing a particularly good job of promoting recycling and litter clean-up in their communities. The level of promotional creativity and sophistication for these programs is growing all the time, and so are their promotion budgets." The editors continue, "Yet, many state programs are constantly re-inventing the promotional wheel because great ideas and materials are not being shared across state borders."

Promoting Recycling to the Public aims to correct that by enabling one state recycling agency to learn of and borrow ideas from others. It also provides concerned companies with the information they need to contribute to recycling programs in their state.

The pamphlets augment this information by offering examples of successful recycling techniques. For example, in the pamphlet on glass containers, the NSDA discusses the value of unattended drop-off "igloos" placed in Washington, D.C., church parking lots. According to the pamphlet, "Congregations keep the money they make from selling the bottles that people have donated to the drop-off center."

Copies are available from the NSDA, 1101 Sixteenth St. N.W., Washington, D.C. 20036.

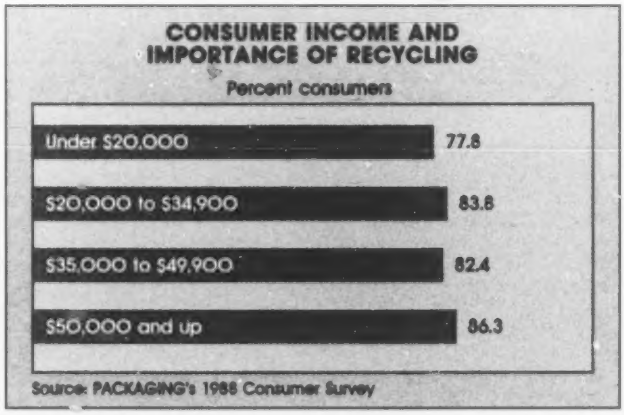
U.S. EPA Cites Magazine Survey

Report draws heavily from PACKAGING

A new report prepared for the Environmental Protection Agency on consumer response to the environmental consequences of product purchase decisions cites PACKAGING magazine's 1988 Consumer Survey as a source of valid consumer data.

The EPA study, scheduled for publication this spring, recommends strategies for raising consumer demand for products and packaging that promote either initial waste reduction or post-use recycling.

Referring to information from the PACKAGING survey, the report states, "Consumers have been convinced that disposable products . . . are more convenient . . . ." To counteract this, the report says, "there needs to be an awareness program aimed at exposing the environmental costs of disposable products . . . ." The report includes numerous other findings from PACKAGING's 1988 Consumer Survey.



Recycling Views Change With Income

Richest consumers see greatest need

Responses from 756 households nationwide show that the perceived importance of recycling rises along with consumer income.

PACKAGING magazine's 1988 Consumer Survey reveals that nearly 78 percent of consumers in the under $20,000 income bracket believe recycling is extremely/somewhat important. This opinion rises to roughly 83 percent as consumer income increases to the $49,900 level. And extremely/somewhat responses jump to 86.3 percent in the highest income bracket of $50,000 and above.

Statistics on consumer responses to a wide range of packaging-related questions for 1989 are now being assembled. A full report on this year's Consumer Survey will appear in PACKAGING's June issue.

Packaging-Waste Coalition Formed

Group to co-sponsor Pack Alimentaire

Innovative Exposition, coordinator of Pack Alimentaire Food & Beverage packaging expositions, has announced that the newly formed Packaging Coalition for Solid Waste Management will co-sponsor Pack Alimentaire '89.

At the exposition, scheduled to be held June 11 through 13 in Chicago, the coalition will focus on waste issues that will affect the packaging field into the next century and what needs to be done at the present time to solve existing problems.

Manufacturers of consumer goods and packaging, package designers and individuals are invited to join the coalition and make use of the group's waste-regulations database and public-relations activities.

For more information about the waste-management program at the exhibition, contact the coalition at P.O. Box 979 Planetarium Station, New York, N.Y. 10024-0979.

MEDICAL DEVICE PACKAGING MEETS COST AND USE DEMANDS

Ease of use, tamper-evidence, and relentless cost-cutting in health care—these factors have helped spawn new, better medical packaging

By Melissa Larson
Senior Editor

The market for medical devices is being rocked by change—and packaging is beginning to reflect these changes.

For products from sterile disposable supplies in the operating room to diagnostic kits used at home, new materials are challenging the reign of old stand-bys, offering new sterilization options, lower cost and easier use by health workers.

Ingenious lab kits for infectious diseases and even drug-abuse testing are being designed with tamper-evidence and ease-of-use features. The aim is to ensure absolute accuracy and confidentiality in this era of independent labs and less skilled technicians.

Overall, medical device packagers and their suppliers are scrambling to keep up with the increased testing and health needs of an aging population. Their goal is to design appropriate packaging which allows health care professionals and home users alike to effectively inventory, administer, and dispose of a host of new medical products.

Materials forecast

A recent research report on the medical packaging market points to plastics as headed for a larger share of the market. Business Communications Co. in Norwalk, Conn., projects plastic materials usage expanding from 40 percent of the total market to approximately 45 percent in 1992. Aggregate growth rate in plastics consumption will be 7.2 percent per year.

The report cites particularly high growth rates among specific plastics which are remaining or becoming popular in new medical packaging designs. They include polyesters, polypropylene, polycarbonates, PVC and polystyrene, as well as some engineering thermoplastics.

Glass will be the principal loser in the future, according to BCC. Although vials, syringes and some bottles and jars will still be made of glass, overall usage will reportedly decline by an average of 1.5 percent over the next five years.

Manufacturers of paper and paperboard materials will concentrate on perfecting innovative lidding materials which are porous, sterilizable and cost-effective, according to the study. Laminates and composites using aluminum foil for pouches, wrappers and liners also provide opportunities.

But plastics appear to be the materials of the future for medical packaging, as designs focus on disposability and the drive to lower costs.

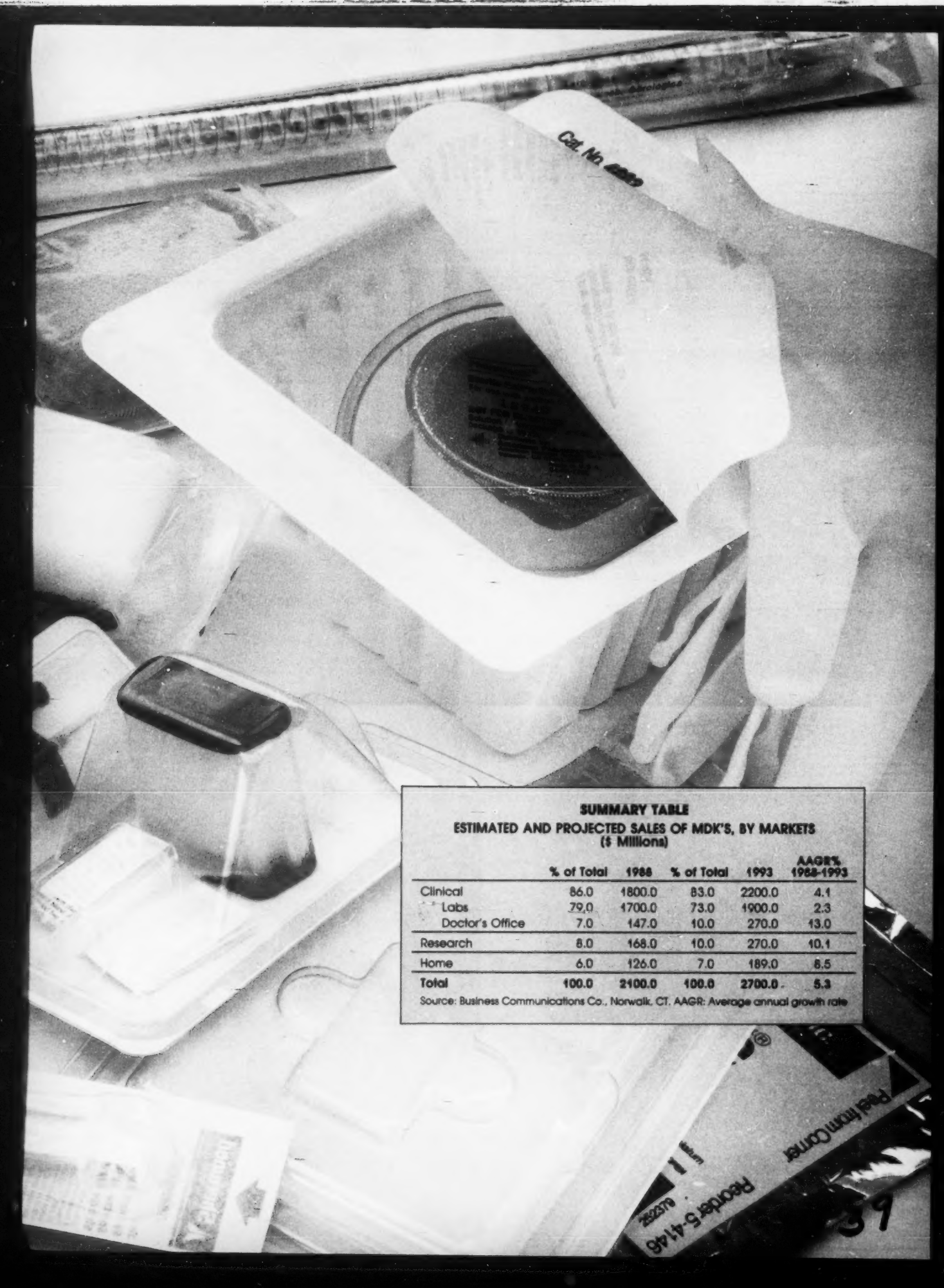
Recent development work has concentrated on the performance characteristics of specific plastics. Such materials ideally should be easy to thermoform, able to stand up to various sterilization techniques without melting or yellowing, and easily bondable to paper or composite lidstocks without leaving peel residue when opened.

Trays and pouches

Sterile plastic trays and pouches, for everything from a pair of rubber gloves or scissors to complete thoracic surgery kits, have become common in the modern operating room. The nurse selects the proper tray, peels open the lidding, and finds the sterile contents carefully laid out for easy use.

After the kit or pouch has been opened, the disposable packaging is discarded—after being recorded via bar code

New medical-device packaging answers the need for low cost, ease of use and sterilization options.



SUMMARY TABLE

ESTIMATED AND PROJECTED SALES OF MDK'S, BY MARKETS
($ Millions)

	% of Total	1988	% of Total	1993	AAGR% 1988-1993
Clinical	86.0	1800.0	83.0	2200.0	4.1
Labs	79.0	1700.0	73.0	1900.0	2.3
Doctor's Office	7.0	147.0	10.0	270.0	13.0
Research	8.0	168.0	10.0	270.0	10.1
Home	6.0	126.0	7.0	189.0	8.5
Total	**100.0**	**2100.0**	**100.0**	**2700.0**	**5.3**

Source: Business Communications Co., Norwalk, CT. AAGR: Average annual growth rate

Sales of diagnostic kits to doctors' offices will jump in the next five years, according to one firm

Paper lidding features vents through which sterilants can pass more easily.

for charging back to the individual patient's hospital bill. It has become more economical for hospitals to use sterile disposable devices of all types than to re-sterilize reusable ones on a regular basis.

New combinations of lidding and tray materials have made these inexpensive, easy-to-use, tamper-evident packages possible.

Among the new options for medical device packagers are steam-sterilizable polycarbonate films, rigid and flexible bottom web films designed expressly for medical and pharmaceutical packaging, new gamma-radiation sterilizable films, and adhesive heat seals which indicate by a color change that the package has been opened and is no longer sterile.

Form-fill-seal packages have enabled medical packagers to lower costs, since they are less labor intensive than pre-formed pouches for these types of products, and also offer better inventory control.

So-called deep draw thermoforming can produce rigid trays of sufficient size to hold several components of a kit or a complicated device, inexpensively.

In fact, a few medical packagers have garnered industry awards and repeat business by offering custom medical procedure designs for the operating room, in which each component of the procedure kit is laid out in the order it will be used.

Some medical packagers have designed trays or pouches which accommodate several different products, with only the on-line-printed lidding language changing as needed.

Pharmaseal Div. of Baxter Healthcare Corp., in Valencia, Calif., says it will be phasing-in a procedural tray design which could accommodate dozens of different sterile products. The tray is a flexible blister made of modified polyethylene and topped by paper/film laminate lidding which is printed on-line. The design replaces heat-sealed gabled cartons.

Test kits

Medical diagnostic kits, designed for testing patients' blood and other specimens for ailments ranging from strep throat to AIDS, have changed along with the testing market.

Fewer hospitals can now afford large in-house labs, and instead are contracting with independent laboratories. Doctors are performing tests in their offices which only a few years ago would have been referred to a lab. And in-home diagnostic kits are allowing consumers to perform some "pre-screening" procedures before ever making an appointment with their physician.

Doctors themselves are benefiting from innovations that have made diagnostic tests easier than ever to administer and interpret.

Ease of use and lower costs are projected to help drive a 13 percent per year rise in sales of medical diagnostic kits to physicians' offices for the next five years, according to a recent study of the market by Business Communications Co. (See Table.)

Drug-abuse testing is becoming widespread, as many workplaces institute manda-

Drug test kit in blister, for use by labs, has two-year shelf life. Urine test cup and lid system assure that specimen has not been tampered with during journey to laboratory.

Acrylic-based tray and lidding provides excellent light transmission and chemical resistance for medical packaging, such as this Kendall product.

tory testing. And a blood test for AIDS, as well as other infectious diseases, is now a routine part of premarital screening for many engaged couples. It all adds up to more tests being performed, in more locations, by (in some cases) less-qualified technicians.

Tamper-evident features and clever kit designs have made the testing job a little easier.

The "Quik Test Drug Screen" test marketed by Keystone Diagnostics primarily for law enforcement and pre-employment screening tests, was recently redesigned with resulting longer shelf life and less possibility of moisture contamination.

The new kit is constructed of a PVC-fluoropolymer film laminate blister tray, containing chemically-treated test paper and a syringe. These compartmented items are separated by a perforation, and a peel-off foil-paper-plastic laminate covers the entire tray.

The old package, a polyethylene pouch, occasionally allowed moisture to get into the kit, affecting the test results. The fluoropolymer film layer in the new pack provides an effective moisture barrier, as well as optical clarity, which apparently makes the kit more appealing. Shelf life of the kit has increased from one to two years.

Simple can be beautiful. Plastic Technologies, Inc. has developed an updated tamper-resistant urine specimen container for drug abuse testing, which it says maintains specimen integrity in collection and transport, as well as providing firm evidence that no tampering with the sample has taken place before it arrives at the laboratory. The container, dubbed TRU, was an SPHE award finalist in the medical devices category for 1988.

The container consists of an injection-molded cup and lid. The 120 milliliter cup is made of medical grade polypropylene and the lid from low-density polyethylene, chosen for its sealing characteristics. After the specimen has been collected, the two components lock together using a patented mechanism.

According to the company, once the lid is properly seated, the force required to remove it causes visible damage to the structure. For easy laboratory access to the specimen, a punch-out opening is molded into the lid, and a special tool is provided to properly open the container in the lab. The container can be resealed for storage or disposal by using a supplied plug for the access port.

The container is simple in design, extremely low-cost and yet maintains a high-strength seal during long-distance transport without the use of evidence tapes to seal the specimens.

Plastifilm's carousel test tray facilitates visual color comparisons when various agents are added to throat culture or other specimens. A carousel of molded inserts holding glass vials can be rotated so that each vial is next to the control sample, for easy visual comparison. The base tray holds the bottles of reagent, has a well for pipettes, and can slide into an outer carton or be fitted with a plastic lid.

The tray, which is being used by several major pharmaceutical firms, can be customized for doctors' offices, hospitals and laboratories, for a range of tests—from strep throat and diabetes to hepatitis and AIDS.

Of course, the pace of change in the health care industry will continue to challenge medical device packagers in the future. And an array of innovative materials, processes and unique designs will enable them to meet those challenges. ■

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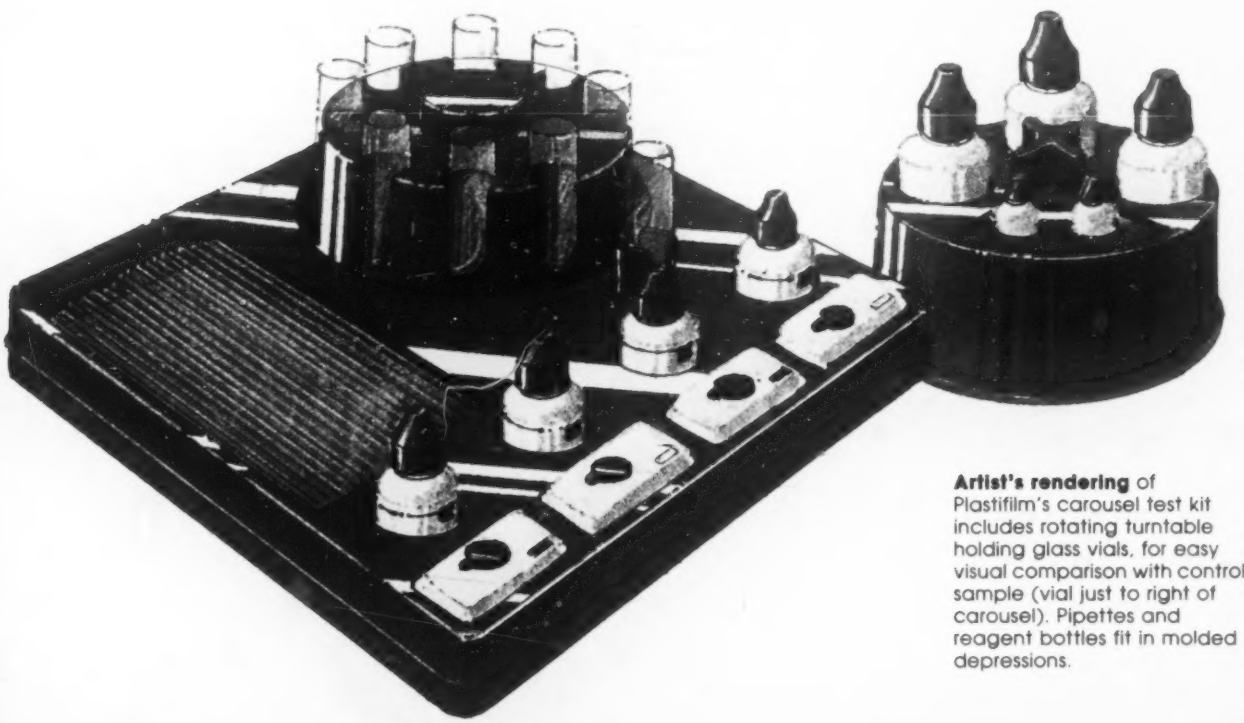
How would you rate this article? To reply, circle the appropriate number on the reader service card:

Outstanding	450
Above Average	451
Average	452
Below Average	453

MELISSA LARSON
Senior Editor
"Packaging innovations have a way of mirroring society's demands, and right now testing for drug abuse and infectious diseases is receiving top priority from medical and pharmaceutical packagers. Safety, confidentiality and disposability are the watchwords."



Artist's rendering of Plastifilm's carousel test kit includes rotating turntable holding glass vials, for easy visual comparison with control sample (vial just to right of carousel). Pipettes and reagent bottles fit in molded depressions.